Eyesight vision system

System description

Most image-processing applications can be rapidly and easily solved with pre-configured VISOR® vision sensors. However, their range of functions is not always sufficient for particularly demanding or specific tasks – but here, too, SensoPart has the right solution: the freely programmable Eyesight vision system offers comprehensive configuration possibilities so that you can also implement very complex automation applications with the smart camera. Whereby complex is not synonymous with complicated: the graphic programming by means of drag & drop makes it easy for you to "construct" your own applications.

EYESIGHT HIGHLIGHTS

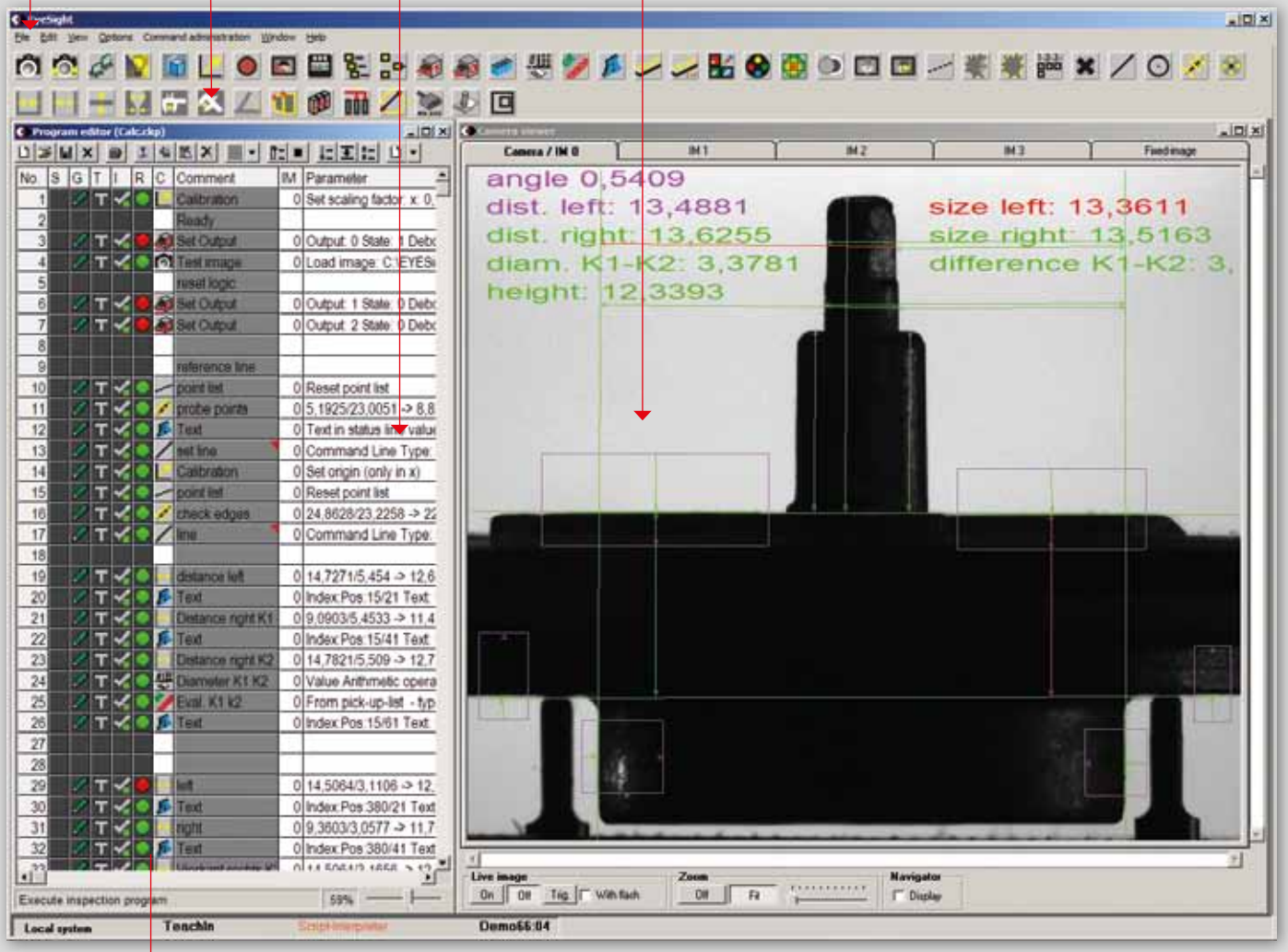
- Complete image-processing package with robust and flexible smart camera
- Programming via drag & drop of function blocks
- Complex iterative linkage of individual inspections
- Image and result visualisation in inspection mode
- Interpreter for programming your own functions
- Image processing can be simulated on the PC without the camera
- Freely programmable data protocol for Ethernet and serial interface

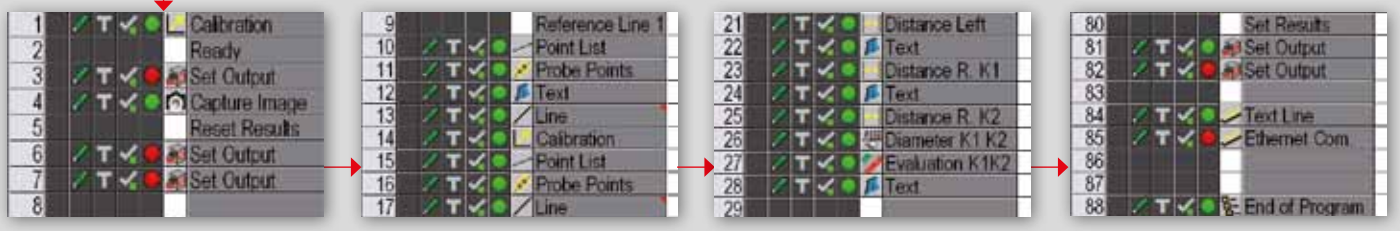
Product variants: the Eyesight vision system

Features/sensors	V20 Advanced	V10 Advanced	V20C Advanced	V10C Advanced
Functions				
Resolution in pixels	1280 x1024, monochrome	736 x 480, monochrome	1280 x1024, color	736 x 480, color
Image rate per second	40	50	20	40
Number of inspection programs	No limitation (max. 40 Mb)	No limitation (max. 40 Mb)	No limitation (max. 40 Mb)	No limitation (max. 40 Mb)
Function blocks	See overview of commands >> Page 60	See overview of commands >> Page 60	See overview of commands >> Page 60	See overview of commands >> Page 60
Interfaces				
Inputs | outputs	2 | 4	2 | 4	2 | 4	2 | 4
Freely definable switching outputs/inputs	4	4	4	4
I/O expansion	✓	✓	✓	✓
RS422 | RS232	✓ | ✓	✓ | ✓	✓ | ✓	✓ | ✓
Ethernet/data transmission	✓	✓	✓	✓
Lens				
Integrated 6 mm | 12 mm	– | ✓	✓ | ✓	– | ✓	✓ | ✓
C-mount	✓	✓	✓	✓
Operation/visualisation				
Viewer software eye view	✓	✓	✓	✓

Overview of the user interface

Menu bar | Command bar | Programme Editor | Camera viewer





Step-by-step to your goal

Step 1

Image capture

- *Calibration*
- *Reset outputs*
- *Enter triggered image*

Step 2

Referencing

- *Object position determination*
- *Define object reference lines*
- *Graphic provision of position*

Step 3

Inspection of parts

- *Measure distances/diameter*
- *Calculate difference values*
- *Define target/actual values*
- *Graphic provision of measurement values*

Step 4

Output of results

- *Set outputs according to results logic*
- *Transmit data to the master computer via Ethernet*
- *End programme*

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Overview of commands: Eyesight vision system

Image/camera

- Image capture
- Camera settings

Colours *

- Select colour channel
- Colour inspection
- Colour filter

Pre-processing

- Calibration and position tracking
- Correct brightness
- Remove background
- Filter functions

Inputs/outputs

- Test input
- Set output
- Access INI file

Inputs/outputs

- Text
- Data transfer, serial
- Data transfer, LAN (text line)

Visualisation

- Image transfer

Measurement

- Image information
- Area test
- List of points
- Determine points
- Determine lines
- Calculate circle
- Calculate distance
- Line distance
- Calculate cross-section

Measurement

- Measure gap width
- Caliper (hor./vert.)
- Caliper (free)
- Calculate angle
- Determine warpage point

Programme control

- Stop watch
- Control of sequence and loop options
- Run subprogramme
- Access variable
- Evaluation

Sample/contour comparison

- Count objects
- Inspect contour
- Track contour

Pattern/contour comparison

- Correlation

Scanning

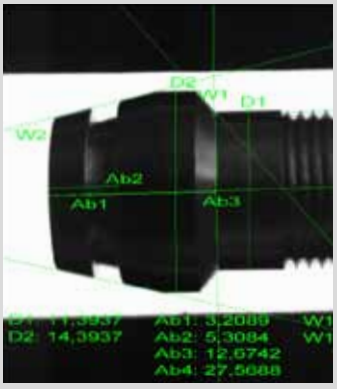
- Scan points
- Circular scanner
- Edge counter (straight)
- Find edges (projected)
- Search ring for counting

Access to libraries

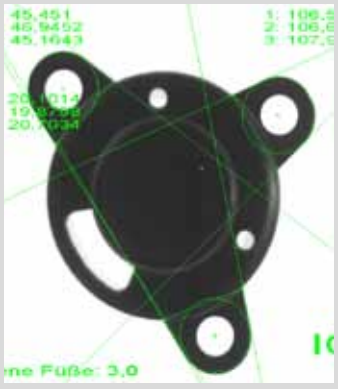
- Script Interpreter

* with colour version

Circle calculator:
Round objects or segments of circles can be measured with this tool for easy detection of deformations. An example of this would be checking for underfilling or overfilling during the plastic process.



Angle calculation:
Components can be tested for dimensional accuracy with the measurement tool. Angles on components, for example, can be determined and evaluated with the angle tool. The thread is also checked for completeness and the dimensions are checked with the help of the distance tool.



Distance calculation:
Any distances in the component can be measured and evaluated with the distance tool. In addition, radii, angles, and drilled holes can also be checked in an inspection programme.

Accessories for VISOR® vision sensors and the Eyesight vision system

System description

Good lighting is all-important for image-processing applications – because the best evaluation system cannot compensate for anything that has already been lost during image capture. This is why all our vision systems have powerful integrated illumination that is more than bright enough for most applications. Supplementary illumination may be helpful, however, in critical lighting situations, e.g. with strong ambient light incidence, or highly reflective or strongly contoured objects. SensoPart offers a comprehensive selection of surface, ring and diffuse lighting with which all applications can be properly illuminated.

Integrated lens or C-mount? In most cases you will also have no problem with the integrated lens of your vision sensor. If necessary for the application, however, with very long measurement distances for example, a C-mount version with a separate lens is available.

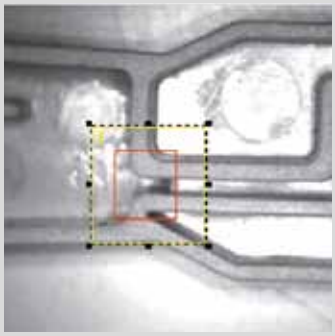
The SensoPart range also covers all eventualities with other accessories, from mounting brackets, through interface cables, to I/O expansion. Because we want to be sure that you are missing nothing!

A few basics regarding good illumination

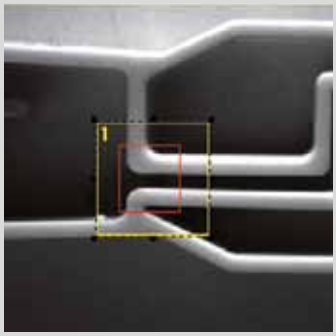
White, red or infrared light?
White light can be used everywhere because it includes the whole spectrum of light, so it achieves good contrast with objects of differing surface properties and colours. Red or infrared light is recommended, on the other hand, for the targeted highlighting or suppression of coloured object features or for eliminating ambient light effects.

Surface or ring lighting?
Every structure has its specific virtues. Surface lighting, for example, is often used for backlit applications in which the target object is lit from behind – so that the external contours are strongly highlighted. Very symmetrical incidental illumination can be implemented with ring lighting, and diffuse illumination is recommended for, among other things, strongly reflective surfaces.

With a bright field
Edges and background are difficult to differentiate.



With a dark field
Edges are clearly highlighted using dark field illumination.



Light or dark field?
Targeted features can be amplified, and interfering effects suppressed, by using the right illumination. Light or reflective features are well differentiated when an object is illuminated from the direction of the sensor (light field); if the light is directed towards the sensor at a slight angle (dark field), the structures of the target object are more strongly differentiated.